REMARKS

Claims 1-26 are pending, with claims 1, 7, 13, 17, 21 and 24 being independent. Claims 1, 7, 13, 17, 21 and 24 have been amended. No new matter has been added. Reconsideration and allowance of the above-referenced application are respectfully requested.

Rejections Addressed During the Telephone Interview:

Claims 21-26 stand rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite. Claim 7 stands rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. Claims 1-13, 15-21, 23-24 and 26 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over McEwen et al. (US 6,732,328) in view of Akiyama et al (US 7,080,313). These contentions are respectfully traversed.

Examiner Fotakis and Examiner Fan are thanked for the interview, which was conducted with Mr. Hunter on September 11, 2007. During the interview, claims 1, 7, 17, 21 and 24, and the McEwen reference were discussed. Agreement was reached at the outset that the rejections under 35 U.S.C. §§ 112 and 101 should be withdrawn. Withdrawal of these rejections is thus respectfully requested.

With respect to the rejections under 35 U.S.C. § 103(a), Mr. Hunter explained the differences between embodiments of the present invention and the traditional Viterbi detector, (referring to paragraphs 23-26 of the Specification) and that McEwen employs a traditional Viterbi detector approach as outlined in paragraph 23 of the Specification. Agreement was reached that the present clarifying amendments to the independent claims, specifying that the

cross-correlation is maximized, clearly distinguishes over the traditional Viterbi detector approach as outlined in paragraph 23 of the Specification.

> A traditional Viterbi detector finds an input sequence, $\hat{B} = \left[\hat{b}_0 \quad \hat{b}_1 \quad \cdots \quad \hat{b}_N\right]$, such that the corresponding output sequence of the partial response channel, $\hat{Y} = \left[\hat{y}_0 \quad \hat{y}_1 \quad \cdots \quad \hat{y}_N\right]$, is the closest to the real sampled output sequence, Y, in the sense of Euclidean distance. Traditional Viterbi minimizes the quantity, $\sum_{k=0}^{N}\left(y_k - \hat{y}_k\right)^2$, by the choice of $\hat{B}$.

See Specification at paragraph 23. McEwen describes using a traditional Viterbi detector in this manner: "The Viterbi detector 50 selects the path with the noiseless ideal sequence that is closest in squared Euclidean distance to the noisy sample sequence." *See* McEwen at col. 10, lines 58-60 (emphasis added). Thus, McEwen does not describe the presently claimed subject matter.

Akiyama does not cure this deficiency of McEwen. In fact, the cited portion of Akiyama also describes using the traditional squared Euclidean distance approach:

> [T]he branch metric $(Zk-Yk)^2$ of each branch at the time point of sample k is calculated. Zk is the reproduction signal level at the time point of sample k. This "branch metric", which is the square of the difference between the reproduction signal level and the expected value, therefore means the square error of the reproduction signal level with respect to the expected value.

See Akiyama at col. 2, lines 8-14 (emphasis added). Thus, Akiyama also does not describe the presently claimed subject matter.

For all of the above reasons, each of independent claims 1, 7, 13,17, 21 and 24 should be in condition for allowance. Dependent claims 2-6, 8-12, 15-20, 23 and 26 should be allowable

based on the above arguments and the additional recitations they contain. For example, each of claims 3, 9, 15 and 19 specify that all the survivor paths merge in M steps, where M corresponds to the target polynomial, $T(D) = p_0 + p_1 D + \cdots + p_M D^M$. The cited portions of McEwen do not specify how many steps are needed for all survivor paths to merge. Moreover, claim 16 recites, "wherein the memory comprises a path memory of length M." The cited portion of McEwen merely states:

> The number of states in a Viterbi detector matched only to the channel is equal to $M=2^{L-1}$, where L is the length of the partial response, i.e. the span of non-zero terms.

See McEwen at col. 3, lines 13-15. McEwen does not specify the length of the path memory as suggested by the Office.

Rejection of Claim 14:

Claim 14 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over McEwen and Akiyama as applied to claim 13, and further in view of Cideciyan et al. (US 6,377,635). This contention is respectfully traversed.

Cideciyan does not cure the deficiencies of McEwen and Akiyama. The Office notes that McEwen and Akiyama "do not specifically show the equation for determining survivor paths" (*see* 05/16/2007 Office Action at page 8) and relies on Cideciyan for the claimed subject matter. Claim 14 recites, "wherein the add-compare-select component compares paths and determines survivor paths by maximizing a quantity defined according to an equation, $\sum_{k=0}^{N} y_k \cdot y_k^*$, where N

corresponds to a sequence length, y_k corresponds to a real channel output, and y_k^* corresponds to an estimated channel output." The cited portion of Cideciyan does appear to show the cross-correlation term in the equations. However, Cideciyan then goes on to describe shifting a set of data dependent or time-varying branch metric terms after the ACS (add/compare/select) unit. *See* Cideciyan at col. 4, line 45, to col. 6, line 47. Cideciyan fails to teach or suggest an add-compare-select component that compares paths and determines survivor paths using generated branch metrics comprising a cross-correlation of obtained output sequences and estimated output sequences for a partial response channel, as claimed. Thus, claim 14 should be in condition for allowance for at least this addition reason.

Rejection of Claims 22 and 25:

Claims 22 and 25 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over McEwen and Akiyama as applied to claims 21 and 24, and further in view of Fisher et al (US 6,249,398). This contention is respectfully traversed.

Fisher fails to cure the deficiencies of McEwen and Akiyama. Thus, claims 22 and 25 should be in condition for allowance for at least the reasons addressed above. Moreover, each of claims 22 and 25 recites, "wherein the sampled channel sequence comprises a waveform of widely varying amplitude, and the Viterbi detection means provides robust tolerance of phase uncertainty with the widely varying amplitude waveform." As noted by the Office, Fisher uses an error generator 64 to provide input via a path 67 to timing control circuitry 70, which in turn adjusts the sampling phase of the sampler 46. However, components 64, 67, 70 and 46 are

clearly separate from the Viterbi detector 60. *See* Fisher at FIG. 2. Thus, these components cannot be equated with the claimed subject matter, "the Viterbi detection means provides robust tolerance of phase uncertainty" (emphasis added). Moreover, Fisher says nothing about a waveform of widely varying amplitude. Thus, claims 22 and 25 should be in condition for allowance for at least these additional reasons.

CONCLUSION

The foregoing comments made with respect to the positions taken by the Examiner are not to be construed as acquiescence with other positions of the Examiner that have not been explicitly contested. Accordingly, the above arguments for patentability of a claim should not be construed as implying that there are not other valid reasons for patentability of that claim or other claims.

In view of the present response, all of the claims should be in condition for allowance. A formal notice of allowance is respectfully requested.

Please apply the one month extension of time fee, and any other necessary charges or credits, to deposit account 06-1050.

Respectfully submitted,

Date: Sept. 17, 2007

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